



How effective are hand antiseptics for the postcontamination treatment of hands when used as recommended?

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Background

Alcohol-based hand antiseptics are often tested using 3 or 5 mL per application, but smaller volumes are likely to be applied in clinical practice. For that reason, we investigated the efficacy of 2 different volumes of 4 marketed hand rubs when applied to contaminated hands.

Methods

Hands of 16 volunteers were contaminated with *Serratia marcescens*. Hand rub A (85% ethanol), hand rub B (60% ethanol), hand rub C (62% ethanol), and hand rub D (61% ethanol) were applied as blinded formulations, each in single applications of 2.4 or 3.6 mL. Hibiclen (4% chlorhexidine gluconate) served as the reference treatment. Each hand rub was rubbed into the hands until dry. Preintervention and postintervention bacterial populations were obtained by the glove juice method. Neutralization of residual activity was validated.

Results

A 2.4-mL aliquot of a hand rub product was sufficient to cover both hands in 96.9% of the subjects. Applied in that volume, hand rubs produced a log₁₀-reduction in bacterial populations of 2.79 for hand rub A, 2.26 for hand rub C, 1.96 for hand rub D, and 1.90 for hand rub B. Application of 3.6 mL was significantly more effective for hand rubs B, C, and D. The reference treatment reduced test bacteria by 2.39 log₁₀. Analysis of variance revealed that both the type of hand rub and the applied volume had a highly significant influence on the mean log₁₀ reduction on artificially contaminated hands ($P < .001$).

Conclusions

Hand rubs applied in amounts sufficient to cover both hands may not reduce the bacterial density by even 2 log₁₀ steps. Based on our findings, the general trend toward alcohol-based hand rubs should not overlook evidence of significant differences in efficacy that appear to be related primarily to a product's overall concentration of alcohol.

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